U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE UNIVERSITY OF NEBRASKA; G. E. CONDRA, DIRECTOR, NEBRASKA SOIL SURVEY.

SOIL SURVEY OF CHEYENNE COUNTY, NEBRASKA.

BY

H. C. MORTLOCK, IN CHARGE, LOUIS A. WOLFANGER, AND GEORGE W. HEARN, OF THE U. S. DEPARTMENT OF AGRICULTURE, AND L. BRITTON, OF THE NEBRASKA SOIL SURVEY.

THOMAS D. RICE, INSPECTOR, NORTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1918.]

WASHINGTON:
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1920.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., October 25, 1919.

SIR: In the extension of the soil survey in the State of Nebraska during the field season of 1918 a survey was undertaken in Cheyenne County. This work was done in cooperation with the University of Nebraska.

I have the honor to transmit herewith the manuscript report and map covering this work and to request their publication as advance sheets of Field Operations of the Bureau of Soils for 1918, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. D. F. HOUSTON,
Secretary of Agriculture.

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MAP.

Soil map, Cheyenne County sheet, Nebraska.

SOIL SURVEY OF CHEYENNE COUNTY, NEBRASKA.

By H. C. MORTLOCK, In Charge, LOUIS A. WOLFANGER and GEORGE W. HEARN, of the United States Department of Agriculture, and L. BRITTON, of the Nebraska Soil Survey.—Area Inspected by THOMAS D. RICE.

DESCRIPTION OF THE AREA.

Cheyenne County is situated in southwestern Nebraska, bordering the State of Colorado and separated from Wyoming by one tier of counties. It is rectangular in form, being 30 miles from north to south and 40 miles from east to west. Its area is 1,194 square miles, or 764,160 acres.

Cheyenne County lies in the western part of the Great Plains, and in the division of that province known as the High Plains. In early Pleistocene time this area was part of a broad plain whose surface formations were made up of sediments brought down from the Rocky Mountain region to the west. This plain was relatively smooth and sloped gently toward the east. During subsequent ages stream channels have been established, their valleys gradually widened, and small drainage ways extended backward into the upland, so that only about one-half the county shows the features of the ancient plain. The two higher areas separated by the valley of Lodgepole Creek are remnants of this constructional surface that have escaped extensive erosion. The table to the north, called the Cheyenne Table by the Nebraska Soil Survey, has a topography ranging from flat to undulating. Extensive flat areas occupy the north-central part of the county, and over part of this table, particularly in township 16, ranges 48 and 49, the surface water stands in shallow depressions after rains. The table south of Lodgepole Creek is more gently undulating, but even here there are considerable areas that have not been dissected. Undrained depressions are not so numerous here, but some of the largest in the county are found on this southern table-land.

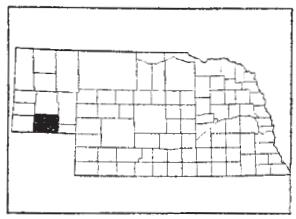

FIG. 1.—Sketch map showing location of the Cheyenne County area, Nebraska.

Sloping away from these relatively flat divides toward the Lodgepole Valley are undulating to rolling belts traversed by numerous drainage ways or draws. The drainage ways in their upper courses

are usually broad, shallow depressions with no well-defined channels, but the lower valleys of the larger streams are sharply cut into the plain and in some places are bordered by steep slopes. Lodgepole Creek in its course across the county is bordered on each side by rough stony areas formed by erosion, and rough areas also occur along many of the smaller streams.

A narrow strip along the northern border of the county and extending across the northeastern corner has been subject to excessive erosion and presents the form of rough, broken escarpments sloping abruptly to the north and northeast. There is a similar area of rough land in the southeastern corner of the county around the heads of the drainage ways leading to the South Platte River.

Lodgepole Creek has cut a channel about 200 feet below the level of the high plain. It winds through a narrow, flat flood plain which it overflows at frequent intervals, and which is bordered by low, smooth terraces, standing 10 to 20 feet above the stream. Remnants of high terraces occur in a few places, 20 to 40 feet above the first bottom. The total width of the Lodgepole Valley, with its flood plains and terraces, ranges from 1 to 2 miles. Sidney Draw and several other streams have narrow flood plains and terraces.

On the basis of topography the county includes four divisions, viz, remnants of the high plains, faintly dissected or rolling plains, the terraces and flood plains of Lodgepole Creek and other drainage ways, and the dissected escarpments along the larger streams.

These types of topography coincide in distribution very closely with the soils of the county. The broad, smooth table is represented on the soil map by the Rosebud silt loam with its various phases. The areas of slow or restricted drainage on the flat tables are shown by the Dunlap silt loam, and the deeper, poorly drained depressions by the Scott silt loam. The more rolling eroded plain is covered by the Rosebud loam and very fine sandy loam. The badly eroded escarpments and ravines coincide with the Canyon gravelly sandy loam and Rough broken land. The flood plains are covered by soils of the Laurel series and the terraces by the Tripp and Cheyenne soils.

Cheyenne County has an average elevation of about 4,100 feet above sea level. It ranges between 3,800 feet, where Lodgepole Creek crosses the eastern county line, and 4,400 feet, near the western boundary. The elevation of Sidney is 4,086 feet; of Gurley, 4,260 feet; Dalton, 4,280 feet; and Lodgepole, 3,833 feet.

Lodgepole Creek and its tributaries drain about two-thirds of the county. Its channel varies in width from 10 to 15 feet, and has an average depth of about 2 feet. The stream has a fall of approximately 8.5 feet to the mile. Sidney Draw drains the southwestern

part of the county, while the northeastern one-fourth is drained by Rush Creek. These two latter streams are dry during part of the year. The rough land along the northern edge of the county drains into the North Platte River in Morrill County. The dissected area in the southeastern corner drains southward and eastward into the South Platte River.

All the county is well drained except some areas on the nearly level table-land where there are occasional slight basins or depressions, without drainage outlets, varying in size from 1 acre to more than 1,000 acres. Some of the basins lie 20 feet or more below the surrounding level, but most of them are quite shallow and many are mere swales. They appear to represent depressions in the original plain, which have been increased in size and depth by wind erosion.

Cheyenne County was organized in 1870, at which time it included a large portion of northwestern Nebraska. Prior to 1885 the county was occupied by cattle men, who made use of the open range. The early settlers became aware of the possibilities of the region as a stock country during the rush to the gold fields in the Black Hills. In 1870 the population of Cheyenne County was 1,032, most of which was confined to Sidney. In 1909 Cheyenne County was left with its present boundaries. The population, as reported by the 1910 census, is 4,551. Settlement has increased considerably during the last few years, and the present population is probably over twice that reported in 1910. The inhabitants are mainly settlers from other parts of Nebraska and from the central and eastern States. About half the inhabitants are of native parentage. The foreign nationalities represented are principally German, Swedish, Danish, Irish, and English. The population averaged 3.8 persons to the square mile in 1910. Settlement is densest in the Lodgepole Valley, while the broken areas in the northern, northeastern, and southeastern parts of the county are very sparsely settled. Sidney, the county seat, in the south-central part of the county, has a population at present of about 2,200. It is a division point on the Union Pacific Railroad, whose shops furnish employment for a large number of workmen. Lodgepole, Potter, Dalton, and Gurley are small towns, named in the order of their importance.

The main line of the Union Pacific Railroad crosses Cheyenne County in an east-west direction, following the Lodgepole Valley. The towns of Lodgepole, Sidney, and Potter are on this line. The Denver-Alliance branch of the Chicago, Burlington & Quincy Railroad crosses the central part of the county from north to south, passing through Sidney, Gurley, and Dalton.

Cheyenne County has a good system of earth roads. The highways are established on section lines, except where the topography is rough, and in the Lodgepole Valley. The more important roads

are graded, and usually dragged soon after rains. The main line of the Lincoln Highway follows the Lodgepole Valley across the county. It is in good condition at most points. Little attention is given to the secondary roads, as the small volume of travel does not warrant frequent grading and dragging. The county is well supplied with rural mail delivery routes and telephones.

Marketing facilities throughout the county are generally good. The farmers in the northeastern part trade in Gurley, Dalton, and Lodgepole, while those in the southern and western parts sell their surplus products in Potter, Sidney, and Lodgepole. Cattle are shipped to Omaha and Chicago, and hogs mostly to Denver. Wheat is sold to the local elevators and either shipped directly to Omaha or stored until market conditions are favorable. Potatoes are shipped to eastern and southern points, the chief market being Kansas City. Most of the dairy and poultry products are sold on the local markets. Cream is shipped to Denver, Alliance, Omaha, and Beatrice.

CLIMATE.

The principal climatic features influencing agriculture in any region are temperature, humidity, winds, evaporation, precipitation, and length of growing season. The climate of Cheyenne County is characterized by a wide variation in temperature, which is typical of the High Plains country. The winters are cold and the summers short and hot. The low winter temperatures occur as cold waves, sometimes accompanied by blizzards and usually lasting from three days to a week. These cold spells and blizzards are damaging to unsheltered farm animals.

There is no Weather Bureau station in this county, but the data from the station at Bridgeport, in Morrill County, are considered as representative. The mean annual temperature as recorded at Bridgeport is 47.7° F. January and February are the coldest months, with a mean of about 25°. The lowest temperature on record is 27° below zero, recorded in January, and the highest, 104°, recorded in both June and July.

The amount and the distribution of the rainfall are of vital importance, as the average precipitation is only slightly above the minimum required for profitable agriculture. Yields are sometimes curtailed by drought, and occasional failures result from this cause. The mean annual rainfall is only 16.85 inches, but 78 per cent of this falls during the growing season, from April 1 to the last of September. The precipitation is mainly in the form of local showers and is extremely variable. The normal precipitation for the driest months—November, December, January, and February—is about one-half inch per month. The rainfall for May and June is usually well

distributed, but in July the distribution is not so favorable. August and September have a relatively small amount of rain, and occasional droughts occur during these months. The snowfall is light, being considerably less than in the eastern part of the State. Local hailstorms are of common occurrence during the summer months.

The average date of the last killing frost in the spring is May 15, and that of the first in the fall, September 17, giving a normal growing season of 125 days. The earliest killing frost in the fall recorded at Bridgeport occurred on August 25 and the latest in the spring on June 6.

The prevailing winds are from the northwest, except in the summer months, when they are from the south and southwest. High winds are of common occurrence throughout the year, though tornadoes are unknown. The winds are of value to the farmers in pumping water and in curing grasses for hay and winter pasture, but these benefits are greatly overbalanced by the injurious effect in increasing the rate of evaporation.

The low average rainfall of this region is the principal factor in controlling agricultural development. It restricts in various ways the varieties of crops grown and has a decided influence on the methods of farming. On account of the subhumid climate only drought-resistant, quick-maturing, and hardy varieties of crops can be grown successfully. Corn sometimes fails to mature grain, but the growing season is long enough to mature a variety of crops suited to this climate and elevation. Most tree fruits are uncertain in yield.

The following table, showing the more important climatic data, is compiled from the records of the Weather Bureau station at Bridgeport:

Normal monthly, seasonal, and annual temperature and precipitation at Bridgeport, Morrill County.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	F.	*°F.*	*°F.*	*Inches.*	*Inches.*	*Inches.*
December	25.5	63	−21	0.59	0.20	0.00
January	24.7	68	−27	.43	.30	1.30
February	24.9	78	−18	.56	.05	1.10
Winter	25.0	78	−27	1.58	.55	2.40
March	36.3	85	−20	.88	T.	.81
April	47.5	93	12	2.01	.67	4.74
May	55.9	94	15	3.58	2.74	5.59
Spring	46.6	94	−20	6.47	3.41	11.14

Normal monthly, seasonal, and annual temperature and precipitation at Bridgeport, Morrill County—Continued.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	F.	*° F.*	*° F.*	*Inches.*	*Inches.*	*Inches.*
June	65.7	104	34	2.46	2.40	2.72
July	72.0	104	39	2.30	2.56	3.87
August	71.4	101	30	1.68	.70	1.65
Summer	69.7	104	30	6.44	5.66	8.24
September	61.8	99	19	1.12	1.00	1.24
October	48.8	90	7	.91	.32	.43
November	37.2	77	−19	.33	T.	.22
Fall	49.3	99	−19	2.36	1.32	1.89
Year	47.7	104	−27	16.85	10.94	23.67

AGRICULTURE.

Prior to the building of the Union Pacific Railroad, Indians occupied the greater part of western Nebraska. After they were established on reserves farther north, cattlemen entered the country. The herds were driven to railroad points and shipped to Chicago. Large profits were realized, since the range was free and luxuriant grasses covered most of the region. During the rush to the gold fields in the Black Hills attention was called to the agricultural possibilities of this region, and about 1885 homesteaders began to enter in large numbers. Following this tide of rapid settlement there occurred some of the worst droughts the region has experienced, culminating in the extremely dry years of the early nineties. All crops were failures, and the farmers emigrated in large numbers. The abandonment would not have been so general had the settlers known how to meet conditions. Conservation of soil moisture was not practiced, and the seed, brought from the more humid regions of Nebraska and other States, was not adapted to the climate of the High Plains. The land was later taken up by farmers, who successfully combined stock raising and grain farming.

The following table, compiled from the census reports, shows the acreage and production of the principal crops in 1889, 1899, and 1909:

Acreage and production of principal crops in Cheyenne County, 1889 to 1909.

Crops.	1889		1899		1909	
	Area.	Production.	Area.	Production.	Area.	Production.
	Acres.	*Bushels.*	*Acres.*	*Bushels.*	*Acres.*	*Bushels.*
Wheat	1,912	10,512	6,377	47,480	15,479	221,741
Corn	17,477	90,506	7,097	96,320	14,403	252,520
Oats	1,264	17,617	1,219	23,160	6,750	185,521
Barley	138	1,300	303	3,080	688	17,217
Rye	215	1,031	1,516	7,880	3,216	40,957
Flaxseed	22	117	.....	.....	389	1,761
Beans	.....	188	1	12	1	9
Potatoes	1,614	57,712	474	30,266	970	71,600
Buckwheat	43	179	3	10	.....	.....
		Tons.		*Tons.*		*Tons.*
Hay	22,962	21,330	42,579	48,280	28,005	20,064

At present the agriculture of Cheyenne County consists chiefly of stock raising combined with grain farming. Over large areas, however, grain production is followed exclusively. Small areas in the rougher parts of the county are used only for pasture and hay. Wheat, the main cash crop, has increased rapidly in acreage during the last few years. According to the report of the Bureau of Crop Estimates of the U. S. Department of Agriculture and the Division of Agricultural Statistics of the Nebraska Board of Agriculture, there were 52,556 acres in spring wheat in 1918, and the average yield was 8 bushels per acre. This is somewhat below the normal yield. On some farms yields of 50 bushels per acre were obtained in 1918. The report of 1918 shows 56,965 acres in winter wheat, averaging 15 bushels per acre. Turkey is the principal winter variety. For spring planting the durum wheats are used.

Corn was grown on 25,354 acres in 1918, with an average yield of 20 bushels per acre. The yield of corn is still rather uncertain and variable, although the introduction of early-maturing varieties has tended to stabilize and increase the production. The 90-day varieties of dent corn, including White Cap, Disco Pride, and Pride of the North, are the most popular. Flint corn is also grown successfully. The acreage devoted to corn is annually extending.

Oats rank next to corn in acreage. According to the 1918 report, there were 12,932 acres in this crop, from which an average yield of 22 bushels per acre was obtained. Yields range from 10 to 75 bushels, depending upon the soil and the seasonal conditions. The average over a series of years is about 30 bushels per acre. Most of the crop

is grown on the tableland in the northern part of the county, and is used for feeding work stock.

Rye ranks next in acreage to oats. A total of 1,851 acres were reported in rye in 1918, yielding 11 bushels per acre, which is somewhat below the average for a number of years. Both spring and fall rye are grown. The crop is generally thrashed for seed, though it is used to some extent for hay and pasture. Some farmers prefer rye to wheat on account of its greater resistance to winter killing.

Barley ranks next in acreage to rye, occupying 1,355 acres in 1918, with an average yield of 15 bushels per acre. The crop is used chiefly as hog feed.

Irish potatoes are grown on a number of farms, the total acreage reported for 1918 being 942 acres. The average yield is about 115 bushels per acre. The crop is used mainly to supply home needs, but a surplus is sold in local markets. The principal varieties grown are the Early Ohio and Triumph. The soil and the climate are well adapted to potato growing, but the large amount of labor involved in producing and marketing the crop has caused most of the farmers to discontinue potato growing and confine their operations to the growing of small grains.

Flax is occasionally grown on first-year sod, but the present (1918) high price of wheat has caused the practical abandonment of flax. A total of 180 acres are reported in flax in 1918.

Cabbage does well in favorable seasons, and is one of the most important special crops. Navy and pinto beans are other special crops, grown to a small extent on the newly broken sod of the uplands.

Fruit growing has not proved successful in this region, owing to the severity of the winters and the late spring frosts. The steadily increasing demand for fruit is supplied from the outside. Many farmers have small cherry and plum orchards, which yield fairly well in favorable seasons, and these are probably the most successful fruits in the county.

Of the cultivated hay crops, alfalfa is the most important. It is grown both on the upland and on the terrace and first-bottom soils along Lodgepole Creek. The crop is either sown broadcast on a well-prepared seed bed, or seeded in rows with a press drill. The area reported in 1918 was 3,303 acres, and the average yield was 1.5 tons per acre. The yield varies from year to year, according to the rainfall. The hay is generally of excellent quality. It is practically all fed on the farm where produced, the rest being sold in local markets.

Sorghum is one of the principal forage crops, Black Amber being probably the most popular variety. Sudan grass is finding favor with quite a number of farmers. Millet is an important forage crop,

about 500 acres being seeded in 1918. Hog millet and Siberian millet are the most popular varieties. Sweet clover is increasing in importance as a hay and pasture crop. In addition to the cultivated hay and forage crops a total of 12,873 acres of wild grasses was cut for hay in 1918, averaging 1.1 tons per acre.

With the steady rise in land values, range stock raising has been found less and less profitable, despite the fact that the grasses are of excellent quality for putting on flesh. Stock raising now is largely carried on in connection with general farming, the rougher lands being used for pasture. The principal grasses are western wheat grass, grama grass, buffalo grass, needle grass (stipa), big bluestem, and blackroot (a sedge). A square mile of land will support 40 to 50 head of cattle throughout the year, and about 90 head from May 15 to the middle of October. Most of the cattle are shipped off during the late summer as feeders, but small lots are fed for market, being fattened on alfalfa and corn or cottonseed cake and corn fodder. Hereford blood predominates in the beef cattle. Several pure-bred herds have been introduced recently, and the feeding and fattening of live stock gives promise of greater development. The report of 1918 shows 15,113 cattle in the county, of which 2,586 are milk cows. There are in the vicinity of Sidney two large dairy herds which supply that town with milk. The dairy cattle are principally of Holstein breed. Nearly every farmer produces sufficient dairy products for home use, and many small shipments of cream are made to outside points.

Most farmers raise a few hogs, which are fattened on corn and alfalfa. There was a total of 5,195 hogs in the county in 1918. A small flock of chickens is found on every farm and some poultry and eggs are sold from time to time in the towns.

The work stock consists largely of horses, and a few ranchers raise horses for market. There were 9,020 horses and 785 mules in the county in 1918.

Experience has shown that the heavier, more nearly level soils of the high table lands are well adapted to the production of grain crops and potatoes, while the alluvial soils of the terraces along the larger streams produce the highest yields of alfalfa. The rough and broken land is best suited for pasture and hay. Much of the Lodgepole Creek bottom land is used in the production of hay, especially where irrigation is feasible.

The most important problems in farming under the subhumid conditions of this region are the conservation of moisture and the prevention of soil drifting. Summer tillage is thought by many farmers to be the most successful way of handling the soil. To prevent drifting the fields are usually left quite cloddy, especially if plowed in the fall. Sod is usually broken to a depth of 3 or 4 inches, with

gang moldboard plows drawn by a tractor. Mechanical power is used extensively in breaking, though horses still furnish power on many farms. The sod is usually double disked, packed, and then drilled to wheat. Quite often the disking and drilling are done in one operation, with a large tractor. The sod is generally broken in May and June; if broken later it does not produce well the following year. Old land is plowed every two or three years. When small grain follows a small grain the stubble ground is generally disked and seeded with a press drill. Wheat is often sown between the rows of standing corn in the fall.

The value of the corn crop in the agricultural economy is being more generally realized each year, and much more care is taken in preparing the land and cultivating the crop. The farmers seem to be divided in choice between listing and plowing with surface planting. The planted corn produces a bigger stalk and more fodder, while listed corn usually withstands drought better. Corn is cultivated two or three times. The crop is generally cut for fodder, or the ears snapped and fed to stock.

Potatoes are a minor cash crop, usually grown after a small grain. About 8 bushels of seed are required to the acre. Potatoes are planted in rows about 3 feet apart with a 1-row planter. The crop is cultivated a sufficient number of times to keep down injurious weeds.

Potatoes are harvested from September 15 to October 1, usually with a 1-row elevating digger drawn by 6 horses, the potatoes falling on the ground behind the machine. The crop is picked and graded by hand and either hauled direct to market or stored in pits until harvesting is finished.

Wheat is harvested with the binder, header, and combine. It is thrashed from the shock or stack, but owing to the large wheat acreage of the county the thrashing is not completed until very late in the fall. Many fields are put back to spring wheat when they can not be cleared in time for fall planting. Most of the grain is marketed direct from the thrashing machine. Scarcity of labor has induced many farmers to invest in combined harvesters and thrashers for gathering the wheat crop; it remains to be seen how successfully these can be operated over a number of years. The forage crops are stacked in the open, or stored in barns for winter feed.

Agriculture in Cheyenne County is in a generally prosperous condition, largely owing to the good yields and high prices of recent years. Most of the farmhouses compare favorably with those of the eastern counties of Nebraska. There are good barns and outbuildings on most of the established farms, and houses with modern conveniences are located in all parts of the county. The buildings

are small on new farms and ranches, but they soon give place to better improvements.

The equipment on many farms consists entirely of tractors and tractor implements, suited for farming on an extensive scale. Other farmers use the tractor only for the heavier work, and have horses for general farming. On most farms there is a good grade of draft horses, ranging in weight from 1,100 to 1,400 pounds. There are also many horses of lighter weight, especially in the rougher parts of the county. These horses are kept on pasture the year round and are used chiefly in the cattle industry. The tractor has perceptibly decreased the demand for heavy horses and the automobile the demand for light horses.

No systematic crop rotation is followed in this county, as the soil is apparently in no immediate danger of becoming exhausted. Farmers are beginning to give more attention to rotating crops, however, as the injurious effects of single cropping are realized. A system followed by a number of farmers consists of wheat two years, followed by corn the third, and oats the fourth year. Some farmers add one year of summer tillage to this rotation. Alfalfa does not enter readily into the rotation on account of the difficulty in obtaining a stand.

Commercial fertilizers are not used in Cheyenne County, but the value of manure in increasing the soil productiveness and aiding the conservation of moisture is more generally realized each year. Some of the farmers have invested in spreaders. The manure is applied to grain fields and pasture lands.

Farm labor is quite scarce in this part of the State, and the ordinary daily wage during the season of 1918 was $4.50 to $5. Monthly wages range from $50 to $65. Most farmers use very little extra labor.

There was a total of 635 farms in the county in 1910, averaging 539.9 acres in size. About 45 per cent of the area of the county was in farms, and 19.3 per cent of the land in farms was improved. The 1918 reports show 351,240 acres in farms, and the total number of farms as 1,290, of which 1,040 were operated by owners and 250 by tenants. Where farms are rented the lessee usually pays one-third of the crop delivered at the market. Where the landowner also furnishes the seed he receives one-half the crop delivered.

Over the greater part of the county the selling price of farm land ranges from $50 to $100 an acre, with an average of about $75. Land values vary with the location, topography, drainage, and improvements. The high table-land best suited to farming ranges in value from $50 to $100 an acre. The terrace and first-bottom land along Lodgepole Creek, adapted to irrigation, has a selling price of $125 to $150 an acre. The rough, broken land in the northern and south-

eastern parts of the county and on the narrow divides between stream valleys sells for $7 to $20 an acre.

SOILS.

The soils of Cheyenne County have been greatly influenced by the climate. The moisture supply in this region is too low to permit the accumulation of much organic matter, and the rainfall is not sufficient to cause the leaching of the whole soil layer. Carbonates occur sparingly in the surface soil, but become concentrated in the subsoil. The well-drained soil on the upland has reached a stage of maturity, and is fairly uniform. It is typical of the High Plains region of western Nebraska, and is characterized by a brown surface soil, a light-colored, compact middle layer, and a highly calcareous subsoil. The upland may be considered as covered by a single soil having minor variations in texture and subsoil compactness. The remaining soils of the county, occupying the slopes, eroded escarpments, and valley floors, differ from the upland soils chiefly in location, topography, and derivation. All the soils, except those of the stream bottoms, are residual, derived from the weathering of the underlying formations.

The residual soils are developed from the Ogallala formation, which consists of sandstone loosely cemented with calcareous material, beds of sand and gravel, and layers of silt and clay. This formation extends through all the upland and outcrops prominently in the principal valley bluffs, where it forms the Rough broken land. The Brule clay formation, which underlies the Ogallala formation, consists principally of buff-colored clay and shale. It is exposed at a number of points in the Lodgepole Valley, but is covered in most of the valleys by alluvial deposits.

The Ogallala formation is of comparatively recent geological age, having been deposited in the upper Tertiary period. It contains gravel derived from a great variety of igneous and sedimentary rocks of the Rocky Mountain region, quartz, feldspar, and granite predominating. The material is of sedimentary origin, having been deposited as outwash débris by streams. Owing to its varied composition, it weathers into a group of soils ranging in texture from gravelly sandy loams to heavy silt loams. The texture depends to some extent upon the amount of decomposition and disintegration that has taken place since the deposition of the parent rock.

The alluvial or stream-deposited soils occupy the high terraces, low terraces, and poorly drained flood plains. Fine sand and silt derived from the Ogallala formation have been deposited in the valley of Lodgepole Creek, while the valleys of the larger draws have been partially filled by relatively coarser wash 5 to 15 feet deep. A small deposit of alluvial-fan material is spread out at the mouths of the

draws entering Lodgepole Valley, and considerable recent alluvial material occurs at the bases of practically all the steeper slopes.

The remnants of the high terrace along Lodgepole Creek represent the oldest alluvial deposits in the county. The surface material of this terrace is generally fine in texture, as it has been subjected to weathering for a considerable time. On the lower terraces along Lodgepole and Rush Creeks and their tributaries the soil is much coarser than on the higher benches, probably owing to its more recent origin and less extensive weathering.

The soils of the first bottoms or flood plains are of Recent origin and in many places are still in the process of formation. They occur chiefly along Lodgepole Creek, lying 2 to 4 feet above the stream. The first bottoms as a rule are poorly drained and are subject to occasional overflow.

In the classification adopted by the Bureau of Soils, the soils are grouped into series on the basis of similarity in color, structure, origin, mode of formation, topography, and drainage. The soil series is divided into types on the basis of texture, which depends upon the proportion of particles of different sizes. The type is the unit of mapping.

The upland soils of the county are classed with the Rosebud, Dunlap, Canyon, and Scott series, and the alluvial or stream-deposited soils with the Tripp, Cheyenne, and Laurel series, of which the Laurel series occupies the first bottoms, and the Tripp and Cheyenne series the terraces or second bottoms.

The surface soils of the types included in the Rosebud series are dark gray to brown, while the subsoils are light colored and very calcareous. A characteristic feature of this series is the light-gray to almost white color of the deeper subsoil. These soils are derived from the light-colored, very calcareous, unconsolidated Tertiary deposits of the High Plains, mainly from heterogeneous sandstone and limestone rocks. The topography ranges from undulating to rolling.

The Dunlap series includes types with brown to dark-brown surface soils, 8 to 12 inches deep, underlain by dark-brown, compact, heavy silt loam. This passes gradually through a light-brown or light grayish brown, heavy silt loam into light-gray to almost white, floury, calcareous silt loam. The soils of this series occupy depressed or very flat areas on the highest table-lands. The material has been derived under conditions of rather restricted drainage from the fine-grained, calcareous sandstones of the Ogallala formation. These soils differ from the Rosebud in their heavy, compact upper subsoils.

The surface soils of the Canyon series are brown to grayish brown, and average 6 to 8 inches in depth. The subsoils are yellowish gray

to brown, the brown predominating in this county. Both soil and subsoil contain numerous fragments of partly disintegrated calcareous conglomerate from the Tertiary "mortar beds." The surface is thickly covered with waterworn gravel ranging in size from small pebbles to stones 2 or 3 inches in diameter. This gravel is composed of many of the minerals occurring in the Rocky Mountain region to the west. The members of this series are mainly residual from unconsolidated, calcareous conglomerates. They occupy rounded hills and ridges whose lower slopes in places are sharply eroded and precipitous.

The soils of the Scott series are dark brown to almost black, and heavy and refractory. The upper subsoil is a dull-brown to black silty clay grading into a stiff, heavy, compact, almost black clay. The subsoil is sticky and plastic when moist, but hard and brittle when dry. Both soil and subsoil have a bluish-gray or slate-colored shade when thoroughly dry. These soils are poorly drained and subject to occasional submergence. They consist of lacustrine material derived from the higher lying soils, and deposited by sheet water or intermittent streams in shallow depressions in the upland plains.

The soils of the Cheyenne series are derived from alluvial-terrace material and from alluvial and colluvial wash which has partially filled the valleys of streams and draws in the western part of the Great Plains region. The surface soils are light brown to grayish brown, with yellowish or grayish-brown subsoils. These soils differ from the members of the Tripp series chiefly in their coarser texture. The surface layer often contains much small gravel, and the subsoil is gravelly or coarse and porous. The latter has a high lime content. The Cheyenne soils are well drained and lie mainly above overflow. They occupy low terraces along Lodgepole and Rush Creeks and their tributaries, and along the smaller draws they occupy the flood plains. They are droughty and not adapted to irrigation.

The soils of the Laurel series are light gray to light brown, and underlain by yellowish-gray to dark-gray subsoils. The latter are often mottled brown or drab, as a result of poor drainage, and they are generally lighter in texture than the surface soils. The surface material is moderately calcareous, and the subsoil contains a high percentage of lime. The Laurel soils are of very recent origin, and in many places still in the process of formation. They are composed of sediments carried down from the adjacent uplands and from the more elevated regions to the west. They occupy first-bottom positions and are subject to overflow. The Laurel soils differ from the Tripp chiefly in topographic position and drainage.

Rough broken land is the name applied to dissected areas too rough for cultivation.

In following pages of this report the various soils of Cheyenne County are described in detail and their relation to agriculture discussed. The distribution of the various soils is shown on the map accompanying this report, and the table below states the name and the actual and proportionate extent of each type:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Rosebud silt loam	256,704	45.5	Cheyenne sandy loam	7,744	1.0
Shallow phase	46,336		Tripp fine sandy loam	6,464	.8
Deep phase	41,024		Dunlap silt loam	4,416	.6
Gravelly phase	3,264		Laurel very fine sandy loam	3,968	.5
Rosebud loam	173,888	22.7	Laurel sandy loam	1,344	.2
Canyon gravelly sandy loam	84,736	11.1	Laurel silt loam	832	.1
Rough broken land	34,944	4.6	Cheyenne loam	768	.1
Rosebud very fine sandy loam	14,272	3.9	Laurel loam	768	.1
Shallow phase	15,680		Scott silt loam	704	.1
Tripp silt loam	25,792	3.4	Total	764,160	.....
Cheyenne gravelly sandy loam	22,784	3.0			
Tripp very fine sandy loam	17,728	2.3			

ROSEBUD VERY FINE SANDY LOAM.

The Rosebud very fine sandy loam has a surface soil of brown to dark grayish brown very fine sandy loam, with an average depth of 8 inches. This is underlain by a light-brown to light grayish brown very fine sandy loam, which changes at about 15 inches to a light-gray or almost white silt loam or very fine sandy loam, containing much finely divided, white, calcareous material.

This soil occurs principally in the northern part of the county, bordering or lying within areas of rough topography. A few areas slightly elevated above the surrounding types and occurring as low, rounded hummocks and sinuous ridges, are mapped on the high table-lands in the north-central part of the county. One of the largest and most typical areas, in T. 17 N., R. 48 W., covers about 4 square miles. A smaller and similar body occurs about 9 miles northeast of Gurley.

The Rosebud very fine sandy loam has a gently undulating to rolling topography and is well drained. Much of the rainfall percolates through the porous soil and subsoil, and it is often difficult to trace stream channels across the surface.

Only a small percentage of this soil is under cultivation, owing largely to its somewhat droughty nature and tendency to drift. Most of it is used as pasture. The native vegetation is about the

same as on the Rosebud silt loam, but, in addition, needle (stipa) grass and sand grasses thrive on this coarser soil. Wheat is the most important cultivated crop, followed by corn and oats. Yields are lower than on the more drought resistant, heavier types. In average years wheat yields 8 to 15 bushels per acre, corn 10 to 18 bushels, and oats 25 to 30 bushels.

Aside from the greater care required to prevent blowing, this type is handled in much the same manner as the Rosebud silt loam. It is considered inadvisable to grow crops requiring considerable cultivation, and small grains and alfalfa are considered best suited. The land sells for $15 to $40 an acre.

Rosebud very fine sandy loam, shallow phase.—The surface soil of the Rosebud very fine sandy loam, shallow phase, is very thin, seldom exceeding 6 inches in depth. Over most of the type the white calcareous sandstone of the Ogallala formation outcrops, giving the surface a spotted appearance. Where conditions have favored the accumulation of organic matter the shallow soil layer is a brown to grayish-brown very fine sandy loam, much resembling the surface material of the Rosebud loam. In a few places, where excessive erosion has been retarded, the phase has developed a shallow subsoil, which never extends below 18 inches. It contains numerous fragments of white, calcareous sandstone, and is generally coarse in texture. Both soil and subsoil are highly calcareous.

This phase is not very extensive, and it is of little agricultural value, largely on account of its droughty nature. It occurs chiefly in the western half of the county, but there are a few scattered areas in the eastern part. The areas are irregular in shape, and vary in size from a few acres to several square miles. One of the most typical is mapped about 6 miles southeast of Potter, surrounded almost entirely by Rough broken land. A large area occurs in the southwestern part of the county in secs. 15, 16, and 17, T. 13 N., R. 52 W.

The surface of this phase is hilly or slightly dissected. In many parts of the county it occupies low knolls and irregular ridges on the high table-land. Drainage is good, and in a few places excessive. The surface is cut by numerous shallow, V-shaped valleys.

Owing to its small extent, rough topography, and droughty nature, this soil is not important agriculturally. It is used for grazing beef cattle and horses. Nutritious grasses, chief among which are redtop, bunch grass, and blackroot (a sedge) afford good pasturage. Some grama grass, buffalo grass, and western wheat grass are encountered. Yucca grows in the more eroded places. This soil supports 30 to 45 cattle to the square mile throughout the year, or about 60 head when used only for summer range. The land sells for $10 to $25 an acre, depending chiefly on the location and topography.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Rosebud very fine sandy loam:

Mechanical analyses of Rosebud very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
372708	Soil	2.2	6.6	5.0	15.6	35.8	29.2	5.6
372709	Subsoil	.1	.2	.4	3.6	54.0	37.0	5.1

ROSEBUD LOAM.

The Rosebud loam, to a depth of 8 to 10 inches, is a brown to grayish-brown, mellow loam, containing little coarse material except in spots where gravel has been brought to the surface by burrowing animals. The upper subsoil is a grayish-brown silty to very fine sandy loam, occasionally containing a slightly higher percentage of coarse particles than the surface material, and grading lighter in color with depth. Little organic matter is encountered below 24 inches where there is a rather abrupt change to the floury, almost white, calcareous silt of the substrata. Fragments of white, calcareous sandstone occur frequently in this soil. The surface material is only moderately calcareous, but below 12 inches the subsoil effervesces freely, showing a high lime content.

The Rosebud loam is one of the most extensive soils in Cheyenne County, ranking second to the Rosebud silt loam in acreage. It occurs chiefly in very irregular, generally elongated areas on the rolling table-land back of the valley escarpments, though much of the type is mapped directly adjacent to shallow drainage channels on the upland. Two of the largest and most extensive areas occur on the high, rolling divides in the southwestern and eastern parts of the county.

The type has a gently undulating to rolling topography, by far the greater part being somewhat rolling. The more nearly level areas occur well back on the high divides. All of the type has good, though not excessive, run-off and underdrainage, but it is not subject to erosion.

About 35 per cent of the type is under cultivation. It is quite retentive of moisture, and well suited to dry farming. The uncultivated areas are used as pasture and hay land. The soil supports a good growth of native grasses, chief among which are grama grass, buffalo grass, western wheat grass, and the sedge blackroot. From 7 to 9 acres is required to pasture a cow or steer throughout the year; about 5 for the summer season.

Both winter and spring wheats are grown, but the former has the larger acreage. The production of corn and oats is small,

though many farmers grow sufficient for farm needs. All yields show wide variations from year to year, rainfall being the controlling factor. Wheat ranges from 10 to 30 bushels per acre, with an average of about 12 bushels. Corn yields 10 to 20 bushels and oats 15 to 40 bushels.

New land of this type is generally broken to a depth of 3 to 4 inches, and as soon as possible disked and harrowed to fill up the spaces between the furrow slices, so as to retard the loss of moisture. To prevent drifting, the surface is kept in a slightly rough or lumpy condition. Under favorable moisture conditions this soil is mellow, loamy, and easily worked, but after prolonged droughts it becomes more compact, so that plowing and the preparation of a good seed bed are difficult or impracticable.

No commercial fertilizers are used on this soil, but barnyard manure is occasionally applied and aids greatly in maintaining the productiveness.

Land of the Rosebud loam ranges in price from $20 to $75 per acre, the smoother land near markets bringing the highest prices.

ROSEBUD SILT LOAM.

The soil of the Rosebud silt loam is a brown to dark grayish brown, friable, loose silt loam, with an average depth of 8 to 10 inches. The immediate surface layer is usually somewhat darker than the lower surface soil, owing to a large content of organic matter. The color is darkest in the flatter areas, where conditions have favored the accumulation of organic matter. The upper subsoil is a light-brown, mellow silt loam passing into a gray or grayish-brown, almost pure silt or silty clay. In a few places the upper subsoil is slightly compact, but it crushes into the typical mellow structure. The lower subsoil, below a depth of about 20 inches, is a loose, floury, calcareous silt, very light gray to almost white in color. The surface soil contains a small proportion of lime, and the subsoil is highly calcareous.

The Rosebud silt loam occurs chiefly on the high table-land in the northern and southern parts of the county. The areas are generally large and very uniform in texture, but they include some small bodies of other soils. This is the most extensive type of the table-land section of Cheyenne County.

The Rosebud silt loam has been derived by weathering from the calcareous sandstone of Tertiary age. The surface in places becomes gently undulating, but by far the greater part of the type occupies an almost flat plain. Surface drainage is rather poorly established, and most of the type depends entirely on underground seepage. The loose, porus soil and subsoil afford an ample outlet for rainwater even during the wettest seasons.

This is one of the most important soils of the county on account of its large extent and its natural crop adaptation. About 60 per cent of it is under cultivation, the remainder being used for pasture and hay. The native vegetation includes grama grass, buffalo grass, wire grass, western wheat grass, and blackroot. The most important crops are wheat, corn, oats, and potatoes. As on most of the soils of the county, wheat is the principal cash crop. Both spring and winter varieties are grown, but the latter are most popular. Corn is grown as extensively as on any type in the county. Only the early maturing varieties are planted, chief among which are Calico, Squaw corn, Disco Pride, and Pride of the North. Oats are grown to supply feed on the farms and ranches. Swedish Select and Kherson are the principal varieties. Potatoes are produced for home consumption and for sale on the local markets.

Wheat yields 12 to 40 bushels per acre, depending upon the rainfall. In average years corn yields about 20 bushels, oats 30 bushels, and potatoes 100 bushels per acre. Under the prevailing methods of tillage the soil retains sufficient moisture to insure crops, except during seasons of prolonged drought. No definite rotation is followed, as the soil has not yet become impoverished through cropping. New land is generally broken to a depth of 3 or 4 inches, often by means of heavy moldboard plows drawn by tractors. Old land is plowed every two or three years. Small grains are usually drilled in on old stubble or corn ground, though some winter wheat is seeded between the corn rows. Corn is generally listed. A small acreage of this crop is planted on newly broken sod land.

The selling price of land of the Rosebud silt loam ranges from $30 to $125 an acre, depending upon the improvements and location.

This type is naturally very retentive of moisture, and good yields are obtained except in the driest years. It is advisable to keep the surface well mulched by frequent cultivations, however, in order to prevent excessive evaporation.

Rosebud silt loam, deep phase.—The deep phase of the Rosebud silt loam occurs on the flat table-land in the northern part of the county. In soil and subsoil texture, structure, and color and in drainage it is identical with the typical Rosebud silt loam, but it differs in the thickness of the upper subsoil. The loose, floury, calcareous silt of the lower subsoil is seldom encountered above a depth of 30 inches. This phase is preferred to the typical Rosebud silt loam principally because of its flat topography and greater drought-resisting qualities.

Rosebud silt loam, gravelly phase.—The gravelly phase of the Rosebud silt loam is readily recognized by the layer of loose quartz and igneous gravel on the surface, rarely exceeding a depth of 2 inches. Areas of this phase are mapped in southern and western

parts of the county. It is all under cultivation, although it is considered of less value than the typical silt loam on account of its droughty nature.

Rosebud silt loam, shallow phase.—The surface soil of the Rosebud silt loam, shallow phase, is a brown to dark grayish brown silt loam containing varying amounts of very fine sand. On the more nearly level areas, where erosion has been retarded, the soil changes at 6 to 8 inches into a light-gray or almost white, floury, calcareous silt. On the more dissected areas, however, the light-colored subsoil is encountered very near the surface, and seldom at a greater depth than 3 to 5 inches. The parent rock, of the Ogallala formation, is nowhere below the 3-foot level, and over most of the phase it occurs within 15 inches of the surface.

This phase is rather extensive. It occurs in irregular, scattered developments over the entire table-land sections of the county, the areas ranging in size from a few acres to several square miles.

Owing to the shallow nature of this soil and its droughty character, it is not used extensively for crops. It supports a good growth of grasses and is used almost exclusively for pasture and hay production. The land is usually sold in connection with the better farming types.

Below are given the results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the typical Rosebud silt loam:

Mechanical analyses of Rosebud silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
372703	Soil	0.4	1.0	1.6	9.4	43.0	38.4	6.2
372704	Subsoil	.4	1.1	1.6	9.7	42.4	36.2	8.8
372705	Lower subsoil	.0	.4	.4	4.0	52.2	37.8	5.6

DUNLAP SILT LOAM.

The Dunlap silt loam, to a depth of 8 to 12 inches, is a dark grayish brown silt loam. The immediate surface layer is often considerably darker than the lower surface soil, owing to a large content of organic matter. The subsoil is a dark grayish brown to dark-gray silt loam to silty clay loam. It is generally more compact than the surface material, probably as a result of a downward leaching and concentration of the finer soil particles in the process of weathering. The subsoil differs from that of the Rosebud series in its darker color and more compact structure. The heavy, compact subsoil continues throughout the 3-foot section. There is a moderate lime content in the surface soil, and the subsoil is highly calcareous.

The Dunlap silt loam occurs in shallow depressions surrounded by soils of the Rosebud series. The areas are small and irregular in outline. One of the largest and most typical occurs about 10 miles due east of Lorenzo. A much smaller though very typical area occurs about 2 miles southwest of Dalton on the west side of the Chicago, Burlington & Quincy Railroad.

The soil has been derived by the weathering, under poor drainage conditions, of the calcareous sandstone of late Tertiary age. The topography is flat, the type occurring in shallow depressions, and surface drainage is poorly established, but owing to the light rainfall and the porous nature of the soil and subsoil, there is little accumulation of water on the surface except shortly after heavy rains.

Although this type is of small extent, it is one of the most important soils in the county. It is productive, retentive of moisture, and well adapted to farming in a region of light rainfall. Practically all of it is under cultivation, the most important crops being corn, wheat, potatoes, and oats. All the grains common to the region can be successfully grown. Both dent and flint varieties of corn are grown. Of the dent varieties, White Cap, Disco Pride, and Pride of the North are the most popular. Wheat is the principal cash crop. Both spring and winter varieties are grown, but the latter occupy the much greater acreage. For fall sowing Turkey is the principal variety, and for spring sowing varieties of the durum type. This is recognized as one of the best potato soils in Cheyenne County. The principal varieties grown are the Early Ohio and Triumph. Oats, mainly Kherson and Swedish Select are grown, chiefly for feed.

Corn averages about 20 bushels per acre, but the yield varies widely with the rainfall. Wheat yields 12 to 15 bushels per acre, and oats about 30 bushels. The average yield per acre of potatoes is about 100 bushels.

Owing to the somewhat heavier texture of this soil, greater care is required in cultivation than is necessary on the other important upland soils. If it is plowed while wet there is a tendency to clod, though the clods are easily reduced. No definite crop rotation is followed and no fertilizers are used, as the land has not been in cultivation long and there is no immediate danger of its becoming exhausted. Small grains are usually drilled in on old corn or stubble ground. Corn generally follows a small grain, though many fields have been in this crop for several seasons. Potatoes are seldom planted on the same ground two years in succession, but generally follow small grain. Corn is listed, as with this method the soil conserves moisture better than where the crop is surface planted.

Areas of the Dunlap silt loam sell for $25 to $125 an acre, depending upon the location and improvements.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Dunlap silt loam:

Mechanical analyses of Dunlap silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
372701	Soil	0.2	0.4	0.6	5.0	37.0	45.9	11.1
372702	Subsoil	.2	.5	.6	5.4	42.0	42.4	9.4

CANYON GRAVELLY SANDY LOAM.[1]

The soil of the Canyon gravelly sandy loam is a brown to light-brown, loose gravelly sandy loam, continuing with little change throughout the subsoil. At 6 to 8 inches the material becomes light brown or yellowish, and is notably more calcareous. The gravel, of which the type contains a large percentage, consists of rounded water-worn fragments of a great variety of crystalline rocks occurring in the underlying Ogallala formation. The soil material is shallow and overlies the parent rock without the intervening lower subsoil of white, floury, calcareous material characteristic of the lower subsoils of the Rosebud series.

The Canyon gravelly sandy loam occurs in all parts of the county, principally around the heads of streams and along the valley walls. A very typical area borders the Lodgepole Valley on both sides of Sidney. Other areas occur along Lodgepole Creek in the vicinity of Potter, Sunol, and Lodgepole. Small areas are mapped on the high table-land north of Potter. The type has been derived from the underlying coarser strata of the Ogallala formation. The topography ranges from very rolling to hilly, and is characterized in general by steep slopes and gullies. Drainage is good and over much of the type excessive, as the loose, porous soil and subsoil allow rapid percolation.

The rather rough surface of the type and its thorough drainage make it poorly adapted to dry farming, and it is used exclusively as pasture land. It supports a good growth of grama grass, buffalo grass, bunch grass, and blackroot, and affords fair grazing. It does not support as many cattle to the acre as the soils of heavier texture. The land sells for $10 to $20 an acre, the price being based entirely upon its value for pasture.

[1] The Canyon gravelly sandy loam as mapped in Cheyenne County is identical with the Sidney gravelly sandy loam in Kimball County. The Sidney soils were later correlated with the Rosebud, as the series characteristics of most of the types are practically the same. Since the gravelly sandy loam, however, differs considerably from the Rosebud in subsoil characteristics, it is correlated with the Canyon series in Cheyenne County.

SCOTT SILT LOAM.

The surface soil of the Scott silt loam is a dark-gray to dark-brown heavy silt loam, 6 to 8 inches deep, and rich in organic matter. The subsoil is a very dark gray to black, tough, almost impervious silt loam to silty clay. Both soil and subsoil are sticky and plastic when wet, and bake hard on drying. In a dry condition the soil has a pronounced slate color. Over most of the county the heavy, compact structure continues throughout the 3-foot section, but in a few places the subsoil changes abruptly at about 30 inches into a loose, friable, light-gray or whitish silt to silty clay, much resembling the lower subsoil of the Rosebud silt loam. The soil and subsoil effervesce freely with hydrochloric acid, indicating a high lime content.

The Scott silt loam is distributed in small scattered areas, seldom exceeding 10 acres in size, throughout the upland plains in the northern and southern parts of the county. One of the largest areas lies about 4 miles northwest of Gurley. A very typical area occurs about 3 miles southeast of Dalton. The soil consists of sediments from the surrounding soils accumulated in shallow circular depressions, locally termed "buffalo wallows."

Owing to the basinlike topography, water often stands on the surface for a few days or even several weeks after heavy rains, and on account of its poor drainage the type is used only as pasture and hay land. The native growth consists chiefly of grama grass, western wheat grass, and buffalo grass, buffalo and grama grasses predominating. Owing to the more favorable moisture conditions, the vegetation is more luxuriant than on the surrounding types. This soil is sold in connection with the adjoining types, which determine its selling value.

The staple crops could be grown on this soil if adequate drainage were provided, but this apparently is not practicable over most of the type. It is possible that the type might be drained by digging into the porous gravel beds, which occur at no great distance below the surface.

TRIPP FINE SANDY LOAM.

The Tripp fine sandy loam has a surface soil of light grayish brown, loose, friable fine sandy loam, 10 to 15 inches deep. In the upper 6 inches there is a large content of organic matter, which gives this layer a darker color than the lower part of the surface soil. Over small areas the soil contains a relatively large proportion of fine and medium sand and approaches a loamy fine sand in texture. It usually contains sufficient fine material, however, to have a stable character, and there is little danger of wind erosion, even in plowed

fields. The subsoil is a light-gray to ashy-gray, very fine sandy loam to fine sandy loam, highly calcareous.

This is not a very extensive soil in Cheyenne County. It occurs in irregular, broken strips along Lodgepole Creek and Sidney Draw, closely associated with areas of Tripp silt loam and very fine sandy loam. The largest areas are mapped along Lodgepole Creek, adjoining the first bottom or flood plain. Typical areas occur in the Lodgepole Valley west of Potter and southeast of Sidney. The type is composed of sediment brought down from the adjoining uplands and deposited along stream channels, and represents terrace material in an advanced stage of weathering. The surface is flat, but the slight slope toward the stream channel is sufficient to carry off most of the surplus water, and the loose, porous soil and subsoil give free underdrainage.

This is the least important of the Tripp soils, as on account of its somewhat droughty nature only about 25 per cent of it is under cultivation. The remainder is in native grasses and is used for pasture and hay production. The vegetation consists of sand grass, grama grass, needle grass, and a small proportion of western wheat grass. Cattle raising is the most important industry on the uncultivated areas. The leading breeds represented are the Hereford and Shorthorn. Only a few hogs are raised on the farms, but hog raising promises to develop greatly in importance, as the acreage in corn is increasing each year. Corn, the principal cultivated crop, yields 15 to 25 bushels per acre, depending on the season. All the production is used as feed for cattle, horses, and hogs. Potatoes are grown to a small extent, generally to be consumed on the farm or sold on the local markets. The average yield is about 75 bushels per acre.

Land of this type is prepared for crops and cultivated in the same manner as the Tripp very fine sandy loam. No crop rotation is followed and no fertilizers are used.

The Tripp fine sandy loam can be bought for $15 to $60 an acre, depending on the location and improvements. The lower prices apply to land far from markets and are largely based on its pasture and hay value.

TRIPP VERY FINE SANDY LOAM.

The Tripp very fine sandy loam, to a depth of 10 to 12 inches, is a grayish-brown very fine sandy loam, generally loose and friable, though slightly compact in places. The surface 6 inches contains considerably more organic matter than the lower portion of the surface soil, and is slightly darker in color. The high content of organic matter makes the soil more stable than the coarser members of the series, and aids greatly in checking wind erosion. Over small areas

the alluvial deposits have been greatly modified by colluvial wash brought down during torrential rains by numerous intermittent streams.

Below 12 inches the soil gradually becomes lighter in color, owing to the lack of organic matter, and slightly finer in texture, often consisting of a silt loam which continues throughout the 3-foot section. The surface soil usually is very moderately calcareous, but the lime content gradually increases with depth, and the substratum is highly calcareous.

This is one of the most extensive alluvial soils in the county. It occurs on both the low and high terrace along Sidney Draw and Lodgepole Creek. A typical area occurs about three-fourths mile south of Potter, and a much larger, though not so typical, area is mapped about 2½ miles west of Sidney near the mouth of Sidney Draw.

The surface is almost flat, differing little from that of the Tripp silt loam, but drainage is good as a result of the slight elevation and the porous nature of the soil and subsoil.

The Tripp very fine sandy loam is an important agricultural soil. About 50 per cent of it is under cultivation, the remainder being used as pasture and hay land. The native growth of stipa, sand grass, grama grass, bluestem, and western wheat grass affords excellent hay and pasturage. Beef cattle and horses are raised in large numbers. The principal breeds of cattle are the Hereford and Shorthorn. The stock is generally sold in the fall to eastern buyers for feeders, but many farmers keep cattle on range throughout the year. The type will support about 90 head to the square mile during the grazing season. This is considered by many a better pasture type than the light-textured soils of the high table. The grasses are somewhat more luxuriant, owing probably to the shallower depth to the water table.

This is one of the best agricultural soils of the Tripp series. It is very easily tilled, does not clod, and may be cultivated shortly after heavy rains without serious injury. The type is adapted to all the common crops, including wheat, corn, oats, potatoes, and alfalfa. The average yield of wheat is about 15 bushels per acre. About the same varieties are grown as on the Tripp silt loam. Corn yields 15 to 25 bushels per acre, oats 20 to 40 bushels, potatoes 75 to 150 bushels, and alfalfa 1 to 1½ tons. Two cuttings of alfalfa hay are obtained.

Land of the Tripp very fine sandy loam has an average selling price of about $50 an acre, though some farms have brought as much as $100 an acre. The price depends largely upon the location and improvements.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Tripp very fine sandy loam:

Mechanical analyses of Tripp very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
372722	Soil	0.4	2.2	3.2	19.7	40.6	26.7	7.3
372723	Subsoil	.2	.4	.6	3.6	45.0	40.0	10.3

TRIPP SILT LOAM.

The surface soil of the Tripp silt loam is a brown to light-brown, friable silt loam, 8 to 10 inches deep, usually containing a fairly large proportion of very fine sand. The immediate surface layer is rich in organic matter, which gives it a darker color than the lower portion of the surface soil. The subsoil consists of a light-gray to gray very fine sandy loam, generally continuing throughout the 3-foot section. The soil and upper subsoil are moderately calcareous, and the lower subsoil has a high lime content.

This is a moderately extensive soil in Cheyenne County. It occurs principally on the high terrace along Lodgepole Creek and Sidney Draw. The largest and most typical area, covering a total of about 25 square miles, occurs in a broad belt on both sides of Sidney Draw about 7 miles south of Herdon. Another typical area is mapped on both sides of Lodgepole Creek east of Colton. The type consists of reworked sediment washed down from the uplands and from the more elevated regions to the west. Its surface is almost flat, sloping gently down the valley and toward the stream channel. The slight slope together with the porous nature of the soil and subsoil affords ample drainage.

Owing to its large extent and favorable topography, the Tripp silt loam is a very important soil. Approximately 90 per cent of it is under cultivation, the remainder being used for pasture and hay production. The uncultivated areas support an excellent growth of nutritious pasture grasses, chief among which are western wheat grass, grama grass, buffalo grass, wire grass, and blackroot. The type will support 40 to 50 head of cattle per square mile throughout the year, and 80 to 90 head during the summer season.

On the cultivated areas the chief crops are wheat, corn, and oats. Wheat is the principal money crop. It is grown more extensively on this type than on the very fine sandy loam, owing to the heavier texture. The principal variety of winter wheat grown is Turkey. Durum and Velvet Chaff are the chief spring wheats. The wheat crop is sold directly to the local elevators, which either ship at once

or store the grain until the price is favorable. Corn is grown on many farms. The principal varieties are Disco Pride, Pride of the North, and Chardon White. Most of the corn is fed on the farms and ranches where produced. Owing to the shortness of the stalk and the nearness of the ears to the ground the crop is not shucked, most of the corn being either snapped and stored for winter feed or cut for fodder. Oats rank next to corn in importance. The oat crop is generally fed to work stock, though a few farmers grow a surplus for sale on the local market. In average years wheat yields 8 to 15 bushels per acre, corn 15 to 20 bushels, and oats 20 to 40 bushels.

The Tripp silt loam is handled in much the same manner as the Rosebud silt loam. Less care is required in cultivating, as the flatter topography and lower lying position greatly favor the accumulation and retention of moisture. No commercial fertilizers are used, but manure is occasionally applied to the fields.

The selling price of this land ranges from $25 to $75 an acre, depending upon the nearness to markets and the improvements.

CHEYENNE GRAVELLY SANDY LOAM.

The surface soil of the greater part of the Cheyenne gravelly sandy loam consists of a loose, porous mass of unconsolidated, grayish sand and gravel. Large areas are mapped, however, in which continued weathering has produced a layer of soil, 8 to 10 inches deep, consisting of a brown to dark-brown gravelly sandy loam which contains a large proportion of particles smaller than medium sand. This grades abruptly, however, into the typical loose, unconsolidated gray sand and gravel. Over most of the county there is practically no difference in soil and subsoil throughout the 3-foot section. The sand is principally of the coarser grades, while the gravel varies in size from small pebbles to stones 2 or 3 inches in diameter. There are often present many fragments of lime-cemented sandstone, which make both soil and subsoil calcareous.

The Cheyenne gravelly sandy loam occurs principally as narrow strips of alluvial wash in the beds of the larger intermittent streams. It is also mapped on the high and low terraces along Lodgepole Creek, where areas of thin surface soil are encountered. The strips vary in width from a few rods along the smaller streams to three-fourths of a mile along Lodgepole Creek. A typical area of the unweathered material may be seen about 3 miles south of Lodgepole in the eastern part of the county, and a very uniform body of the type, on which weathering has produced a thin veneer of soil, occurs on the high terrace at Sidney.

The type represents a disintegrated product of the Ogallala formation which has been subjected to very little weathering. The material has been carried down by torrential rains and deposited in

the stream valleys. Despite the flat surface, drainage is in most places excessive, the slight slope, together with the exceedingly open structure of the soil and subsoil resulting in a very droughty soil.

This type is of practically no agricultural importance, being used only for pasture. Most of it supports little or no vegetation except a thin stand of sand grass and small patches of grama grass. Sagebrush is occasionally encountered near the mouths of the smaller valleys. The type has a selling price of $10 to $20 an acre, based entirely on the improvements and the growth of wild grasses.

CHEYENNE SANDY LOAM.

The Cheyenne sandy loam has a light-brown or grayish-brown, loose friable sandy loam surface soil, 8 to 10 inches deep. In some places the surface material contains a relatively large proportion of fine and very fine sand, and has a fine sandy loam texture, but over most of the county there is sufficient coarse sand and fine gravel present to average a sandy loam. The upper subsoil is a loose, incoherent mixture of fine sand and gravel, gray to light grayish brown in color. The content of coarse material increases with depth, and the lower subsoil is composed largely of coarse sand and gravel. As in the case of the Cheyenne gravelly sandy loam, the subsoil contains numerous fragments of lime-cemented sandstone, which make it highly calcareous.

The Cheyenne sandy loam is not a very extensive soil. It occurs in narrow strips on the low terraces of Lodgepole Creek and its tributaries. A small area is mapped in the first bottom or flood plain of Rush Creek in the eastern part of the county. The type is generally associated with the Cheyenne gravelly sandy loam and loam. A typical area occurs in the Lodgepole Valley, about 2½ miles east of Sidney. The largest area, averaging about three-fourths mile in width and approximately 5½ miles in length, is mapped at Brownson. The type has been derived from the same material, and in much the same manner, as the other Cheyenne soils, and represents a gradation between the Cheyenne gravelly sandy loam and loam.

Despite the flat topography, the drainage is generally good, and in a few places excessive, owing to the porous soil and subsoil. The soil is not so droughty, however, as the Cheyenne gravelly sandy loam.

This type is of relatively small extent, and it is not very important agriculturally. Its rather droughty nature makes it unsuited for extensive farming, and only about 20 per cent of it is under cultivation. The uncultivated areas support a fair growth of sand grass, grama grass, and stipa or needle grass. Western wheat grass

and blackroot grass are occasionally encountered. Beef cattle, principally grade Hereford and Shorthorn, and horses are grazed on the uncultivated areas. On nearly every ranch there is a small herd of horses, and a few hogs are raised on many farms. On the cultivated portions of the type wheat, corn, potatoes, and alfalfa are grown, wheat and potatoes being money crops. The same varieties of grain crops are grown, and about the same cultural methods are followed as on the heavier terrace soils, but the yields are somewhat smaller, owing to the more droughty nature of the soil. While not grown extensively, potatoes are an important crop on this type. Early Ohio and Triumph are the principal varieties, though some White Cobbler potatoes are grown on the more sandy areas. Yields range from 50 to 120 bushels per acre. The acreage devoted to alfalfa does not promise to increase, as the soil is too loose and porous for the best yields. Alfalfa is used as feed for cattle and hogs. Areas of the Cheyenne sandy loam have a selling price of $10 to $30 an acre, depending upon the location and improvements.

Below are given the results of mechanical analyses of samples of the soil and subsoil of the Cheyenne sandy loam:

Mechanical analyses of Cheyenne sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
372716	Soil	5.6	10.6	6.6	20.0	34.0	17.6	5.6
372717	Subsoil	2.8	6.0	7.0	30.4	32.4	16.2	5.6

CHEYENNE LOAM.

The surface soil of the Cheyenne loam is a brown to grayish-brown loam, 8 to 10 inches deep, usually fine in texture but generally containing sufficient coarse material to have a friable, mellow structure. The surface material is underlain by a porous layer of unconsolidated sand and gravel, brown to light brown in color. This coarse layer contains a larger percentage of finer materials, including medium, fine, and very fine sand, together with silt, than the porous layer underlying the other members of the Cheyenne series. The surface soil is moderately calcareous, and the subsoil contains many limy rock fragments.

The Cheyenne loam is a very inextensive type. It occurs in strips along Lodgepole Creek, and a small area is mapped along Rush Creek, on the eastern county line. The largest area occurs 3 miles west of Sidney, on the south side of the railroad. One of the most typical areas lies 2 miles southeast of Colton.

The surface of this type is flat, but it is well drained and in fact is somewhat droughty, although more retentive of moisture than the other Cheyenne soils. It is used for the grazing of horses and cattle. A small number of cows, principally Holstein, are kept, supplying Sidney with milk and dairy products. The land sells for $10 to $20 an acre.

LAUREL SANDY LOAM.

The surface soil of the Laurel sandy loam consists of 6 to 8 inches of brownish-gray to gray sandy loam. The upper subsoil is a gray to light-brown, friable fine sandy loam, often tinged with yellowish and frequently mottled with iron-colored stains. With increasing depth it grades into lighter colored, coarser material, which in the lower part of the 3-foot section consists of loose sand with intervening layers of fine sand. The content of organic matter is usually low. Both soil and subsoil are highly calcareous.

This type is confined to four narrow strips on both sides of Lodgepole Creek, in the western half of the county. A very typical and uniform area lies directly west, and the largest area about 5 miles west, of Sidney. The type has a flat surface, and adjacent to the stream channel is poorly drained and subject to overflows. Like the other members of the series, it represents recent alluvium, which in many places is still in process of accumulation.

On account of the poor drainage, the type is used exclusively for pasture and the cutting of hay. The native vegetation consists chiefly of wire grass and marsh grasses, with rushes and sedges in the poorly drained areas, and big bluestem, grama grass, and sand grass in the better drained areas. The yield of hay averages one-half to 1 ton per acre, but the hay is coarser than that cut on the upland soils and brings a lower price. The type will support 40 to 50 head of cattle throughout the year. It ranges in selling price from $15 to $30 an acre, depending upon the location and drainage.

LAUREL VERY FINE SANDY LOAM.

The surface soil of the Laurel very fine sandy loam is a grayish-brown to light-brown very fine sandy loam, 8 to 12 inches deep, rich in organic matter and moderately calcareous. It is underlain by yellowish-brown to gray, loose fine sandy loam which continues to the bottom of the 3-foot section, frequently interspersed with layers of very fine sand. In some areas the surface soil is underlain by a subsurface layer of slightly heavier very fine sandy loam, 4 to 10 inches thick. In other areas the lower subsoil grades into a loose mixture of coarse sand and small quantities of fine gravel. The subsoil is deficient in organic matter, and highly calcareous. It is generally mottled brown or drab, as a result of poor drainage.

This type occurs in narrow strips several miles in length along both sides of Lodgepole Creek, in the eastern half of the county, and in one on the western county boundary where Lodgepole Creek enters the county. The most typical area is directly south of Lodgepole.

This is the most extensive of the Laurel soils. Like the Laurel loam and sandy loam it represents the most recent alluvial deposits of the first bottoms or present flood plains, and is subject to frequent deposition of additional sediment. The surface is flat, and owing to this, to its low position, and to the shallow depth to the water table, most of the type is poorly drained.

This is the most important first-bottom soil in the county, but it is used entirely for pasture and hay production. The native growth includes a large number of water-loving grasses, chief among which are wire grass and marsh grass. Rushes and sedges are encountered in many places, and in the better drained areas grama grass, big bluestem, and western wheat grass flourish. Owing to the better moisture conditions, the grass growth is more luxuriant than that on the upland types. Box elder and cottonwood constitute the chief tree growth.

This land will support 90 to 100 head of cattle to the square mile during the grazing season. Native hay yields three-fourths ton to 1½ tons per acre, the larger yields being obtained under irrigation. The hay is coarser than that grown on the uplands, and brings a lower price on the local markets.

The selling price of areas of the Laurel very fine sandy loam ranges from $20 to $150 an acre, depending upon the location, drainage, and irrigation facilities.

Below are given results of mechanical analyses of samples of the soil and subsoil of the Laurel very fine sandy loam:

Mechanical analyses of Laurel very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
372730	Soil	0.0	0.4	0.4	7.4	38.8	43.8	9.2
372731	Subsoil	.2	2.4	2.8	19.2	47.6	19.0	8.8

LAUREL LOAM.

The surface soil of the Laurel loam is a loose, friable, grayish-brown to light-brown loam, with an average depth of about 8 inches. It often contains many small pebbles and considerable sand of various grades. A large proportion of organic matter makes the surface layer darker colored than the lower portion of the surface soil, so

that it appears almost black when wet. The upper subsoil is a light-gray to light-brown very fine sandy loam, which below 24 inches becomes somewhat coarser and contains a small amount of fine gravel. Both soil and subsoil are calcareous.

The Laurel loam is confined to one area on the south side of Lodgepole Creek about 2 miles southeast of Sunol. It has an average width of about one-fourth mile and is approximately 4 miles long. The soil is of very recent origin and is still in process of deposition. It consists of an admixture of materials washed down from the adjoining upland. The surface is flat, but the type occupies somewhat higher areas than the other members of the series, and as a rule is better drained. It is rarely overflowed.

Though of small extent, the loam is the most important agricultural type of the series in Cheyenne County. Approximately 20 per cent of it is under cultivation, the remainder being used as pasture and hay land. Corn is the principal cultivated crop, but only early-maturing varieties are planted. The native vegetation consists of wire grass, western wheat grass, grama grass, and blackroot grass, and affords excellent pasturage. The type is used more extensively for grazing than the lower lying soils of the series chiefly on account of its poorer adaptation to hay production. It will support about 80 head of cattle per square mile. In average years corn yields 20 to 25 bushels per acre. Yields are larger than on the upland soils of similar texture, chiefly on account of the nearness of the water table to the surface. Hay yields one-fourth to one-half ton per acre. This soil under cultivation is handled in the same manner as the Tripp soils. Land values are difficult to state, but probably average about $35 an acre.

Mechanical analyses of samples of soil and subsoil of the Laurel loam gave the following results:

Mechanical analyses of Laurel loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
372728	Soil	0.6	3.5	3.2	27.2	37.8	19.6	8.3
372729	Subsoil	.3	2.4	1.8	17.6	35.2	31.6	11.2

LAUREL SILT LOAM.

The Laurel silt loam is a grayish-brown or gray silt loam to a depth of 8 to 10 inches. In some small areas there is an admixture of very fine sand, which gives a very fine sandy loam texture. The subsoil is a light-brown to light-gray very fine sandy loam. The immediate surface material often is almost black, owing to a large con-

tent of organic matter, but the subsoil is deficient in this material. Below a depth of about 24 inches the substratum is often mottled with iron-colored stains attributable to poor drainage. Both soil and subsoil are highly calcareous. Most of the type contains soluble salts, but not enough to be harmful to crops.

The Laurel silt loam occurs in narrow, broken strips varying from one-fourth to one-half mile wide, in the first bottoms or flood plains of Lodgepole Creek. Only three areas are mapped, all of which occur east of Sidney. The most typical area is that on the north side of Lodgepole Creek, about 1½ miles west of Lodgepole. A larger though not so uniform area is mapped on the south side of the creek about 1½ miles southeast of Sunol. The smallest area occurs directly south of Sunol.

The surface is flat except for occasional depressions in which water stands for a few days after heavy rains. Most of the type is subject to inundation during periods of high water.

The Laurel silt loam is of little agricultural importance. Practically none of it is used for crops on account of the poor drainage, but it supports an excellent growth of nutritious grasses and makes good hay land. The native vegetation includes a number of water-loving grasses, chiefly marsh grass and wire grass. Bluestem is occasionally encountered in the higher lying areas. While the hay produced is coarser and of less value than that obtained on the adjoining uplands, the yields are considerably greater, ranging from three-fourths to 1 ton per acre. The hay is stacked and usually fed during the winter, though some is sold on the local markets. The land ranges in price from $15 to $40 an acre, depending upon the improvements and the location with respect to markets.

ROUGH BROKEN LAND.

Rough broken land is the name applied to extensive areas which are topographically unsuited to farming. The surface is extremely rough and broken, and steep slopes, canyons, and gullies abound. The type is characterized by rock outcrop, with cliffs and vertical walls in places where erosion has been severe. Much of the type is nearly barren of soil.

The principal areas of Rough broken land occur in the northern and northeastern parts of the county, and along the steep breaks bordering Lodgepole Creek and Sidney Draw. A typical area may be seen at Point of Rocks, a prominent land form about 4 miles east of Potter. Drainage is generally excessive, as the streams have a steep gradient and following heavy rains are torrential. The type has been carved from the underlying Tertiary formation, which is readily dissected by streams into a rough topography.

There is a fairly good growth of grasses where erosion has not been excessive, blackroot grass, grama grass, buffalo grass, and western wheat grass being the most important species. Scrub pine timber grows on the steeper slopes. The land will support 25 to 30 head of cattle throughout the year, with hay added to the ration during severe weather. The roughness of the topography affords protection to stock during the winter. This land is valued only for pasture, and can be bought for $8 to $12 an acre, depending on the improvements and grass growth.

SUMMARY.

Cheyenne County lies in the western part of Nebraska, in the High Plains division of the Great Plains. It comprises an area of 1,194 square miles, or 764,160 acres.

The topography varies from flat on the high table-land and in the case of the alluvial lands in the stream valleys, to rough and dissected in the areas of Rough broken land.

The elevation of the county above sea level ranges from approximately 4,400 feet near the western boundary to about 3,800 feet where Lodgepole Creek crosses the east county line. The average elevation is approximately 4,100 feet. The general slope of the county is southeastward.

Drainage is well established except in depressions on the upland and in portions of the flood plain along Lodgepole Creek. This stream, a tributary of the South Platte, traverses the central part of the county from west to east and drains the greater part of the area. The northern and northeastern parts drain into the North Platte River through Rush Creek and numerous small intermittent streams.

The population of Cheyenne County is reported by the 1910 census as 4,551, and it has greatly increased during the last few years. The early settlers in this region came principally from other sections of Nebraska and eastern States. According to the 1910 census about 48 per cent of the population consists of native white persons of native parentage. The entire population is classed as rural. Sidney, the county seat, is the largest town, with a population in 1910 of 1,185.

Transportation facilities are good throughout the greater part of the county. Railroad service is afforded by main lines of the Union Pacific Railroad and the Chicago, Burlington & Quincy Railroad. There is a comprehensive public-road system reaching all parts of the county. Telephone and rural mail delivery service is adequate throughout the county.

Omaha and Denver are the principal general markets for agricultural products. The towns within the county afford good local markets.

The climate of this region is subhumid, and characterized by extremes of temperature. The mean annual temperature is 47.7° F., and the mean annual precipitation is 16.85 inches. Occasional long droughts occur during the summer months. There is a normal growing season of about 125 days.

Agriculture in Cheyenne County consists mainly of grain farming, though large areas are used as pasture and hay land. Stock raising is an important industry in the rougher sections.

No commercial fertilizers are used in this county, and crop rotation is not systematically followed.

Land ranges in value from $8 to $200 an acre. The greater part of the farm land has a selling price of $50 to $100 an acre, averaging about $75.

On the basis of origin, the soils of Cheyenne County are grouped into two classes, residual and alluvial. The weathering of the underlying Ogallala formation has given rise to the soils of the Dunlap, Rosebud, and Canyon series. Sediments washed from the residual soils of the upland have produced the alluvial soils of the Scott, Tripp, Cheyenne, and Laurel series. Rough broken land represents badly eroded and dissected portions of the original high plains.

The Rosebud soils are quite extensive. The loam and silt loam are the most important agricultural types. All the crops common to the region can be successfully grown on these soils. The shallow areas of the loam and silt loam are used chiefly for grazing.

The Dunlap silt loam is not an extensive type, but it is one of the best dry-land farming soils in the High Plains region. Good yields of all crops are obtained except in the driest seasons. Wheat and potatoes are the principal crops on these soils.

The Canyon gravelly sandy loam is quite rough and dissected, and is used only for pasture.

The Scott silt loam is not well drained, and for this reason is not used extensively for crops.

Of the Tripp series, the very fine sandy loam and silt loam are the most important. The fine sandy loam is used chiefly for grazing and hay production.

The Cheyenne soils are somewhat droughty, and are consequently used mainly for pasture. Crops are grown to some extent on the loam.

The Laurel soils are among the most valuable hay-producing types in the county. Crops are grown in places on the better drained portions.

Rough broken land is used only for pasture.

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[PUBLIC RESOLUTION No. 9.]

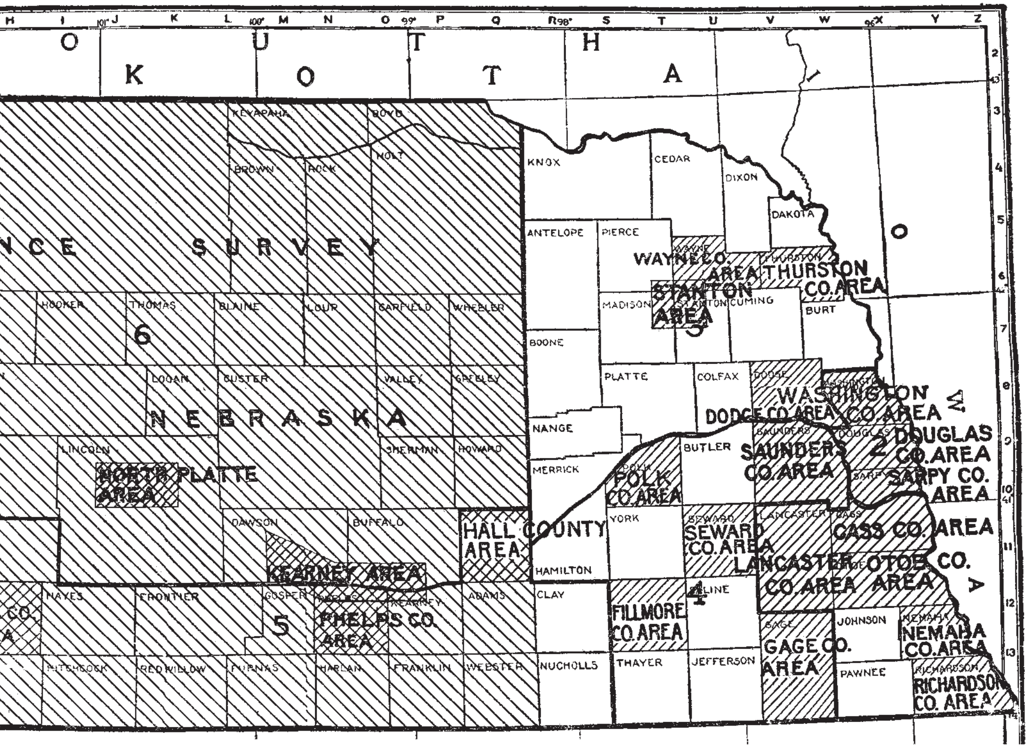
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture. *Provided,* That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]



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KEARNEY AREA
HALL COUNTY AREA
PHELPS CO. AREA
POLK CO. AREA
FILLMORE CO. AREA
SEWARD CO. AREA
LANCASTER CO. AREA
GAGE CO. AREA
WAYNE CO. AREA
STANTON AREA
THURSTON CO. AREA
DODGE CO. AREA
WASHINGTON CO. AREA
SAUNDERS CO. AREA
DOUGLAS CO. AREA
SARPY CO. AREA
CASS CO. AREA
OTOE CO. AREA
NEMAHA CO. AREA
RICHARDSON CO. AREA
KEYAPAHA
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BROWN
ROCK
HOLT
KNOX
CEDAR
DIXON
DAKOTA
ANTELOPE
PIERCE
HOOKER
THOMAS
BLAINE
LOUP
GARFIELD
WHEELER
MADISON
CUMING
BURT
BOONE
LOGAN
CUSTER
VALLEY
GREELEY
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NANCE
LINCOLN
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HOWARD
BUTLER
MERRICK
DAWSON
BUFFALO
YORK
HAMILTON
HAYES
FRONTIER
GOSPER
KEARNEY
ADAMS
CLAY
SALINE
JOHNSON
HITCHCOCK
RED WILLOW
FURNAS
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U. S. DEPT. OF AGRICULTURE
BUREAU OF SOILS
MILTON WHITNEY, CHIEF
CURTIS F. MARBUT, IN CHARGE SOIL SURVEY

SOIL MAP
NEBRASKA
CHEYENNE COUNTY SHEET

UNIVERSITY OF NEBRASKA
G. E. CONDRA, DIRECTOR.
NEBRASKA SOIL SURVEY

Thomas D. Rice, Inspector, Northern Division.
Soils surveyed by H. C. Mortlock, in charge,
Louis A. Wolfanger, and George W. Hearn,
of the U. S. Department of Agriculture, and
L. Britton, of the Nebraska Soil Survey.

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1918